# SAF-RC-232 100-IU-2 & 100-IU-6 Remaining **Waste Sites – Soil Full Protocol** FINAL VALIDATION PACKAGE

## COMPLETE COPY OF VALIDATION PACKAGE TO:

Kathy Wendt H4-21

KW 4/22/13 INITIAL/DATE

**COMMENTS:** 

**SDG JP0481 SAF-RC-232** 

Sample Location: 600-303

Date:

15 April 2013

To:

Washington Closure Hanford Inc. (technical representative)

From:

ELR Consulting

Project:

100-IU-2 & 100-IU-6 Remaining Waste Sites - Soil Full Protocol - Waste Site

600-303

Subject:

Polyaromatic Hydrocarbon - Data Package No. JP0481-TAL

### INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0481 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1RFN3	2/20/13	Soil	С	See note 1
J1RFN4	2/20/13	Soil	С	See note 1

<sup>1 -</sup> Polyaromatic hydrocarbons by 8310.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

Appendix 6. Additional Data Requested by Client

## **DATA QUALITY OBJECTIVES**

## **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

#### Method Blanks

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

## Field Blanks

No field blanks were submitted for analysis.

## Accuracy

## Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

## Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of

compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

#### Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All duplicate results were acceptable.

## Field Duplicate Samples

One set of field duplicates (J1RFN3/J1RFN4) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

## Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

### Completeness

Data package No. JP0481 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

## **MAJOR DEFICIENCIES**

None found.

## MINOR DEFICIENCIES

None found.

## REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, September 2009.

# Appendix 1 Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

# POLYAROMATIC HYDROCARBON DATA QUALIFICATION SUMMARY\*

SDG: JP0481	REVIEWER: ELR	Project: 600-303	PAGE_1_OF_1
COMMENTS: No qu	ualifiers assigned		

<sup>\* -</sup> The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

# Appendix 3 Annotated Laboratory Reports

## **Analytical Data**

Job Number: 280-39178-1

Sdg Number: JP0481

Client Sample ID:

J1RFN3

Lab Sample ID:

280-39178-2

Client Matrix:

Solid

% Moisture:

Date Sampled: 02/20/2013 1107

Date Received: 02/22/2013 1000

8310 PAHs (HPLC)

Analysis Method: Prep Method:

Terphenyl-d14 (SUR)

8310 3550C

Client: Washington Closure Hanford

Analysis Batch: Prep Batch:

280-161891 280-161725 Instrument ID: Initial Weight/Volume: Final Weight/Volume:

CHHPLC\_G 30.2 g 4000 uL 20 uL

Analysis Date: Prep Date:

Dilution:

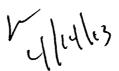
1.0

02/25/2013 1822 02/22/2013 2025 Injection Volume: Result Type:

PRIMARY

A 1. A	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Analyte	Dryvit Corrected. 1	10	U	10	100
Acenaphthene		9.3	Ü	9.3	100
Acenaphthylene			Ŭ	3.2	21
Anthracene		3.2	Ü	3.3	16
Benzo[a]anthracene		3.3	=	6.6	16
Benzo[a]pyrene		6.6	U	4.3	16
Benzo[b]fluoranthene		4.3	U		31
Benzo[g,h,i]perylene		7.4	U	7.4	
Benzo[k]fluoranthene		4.1	U	4.1	16
Chrysene		5.0	U	5.0	41
Dibenzo(a,h)anthracene		11	U	11	31
Fluoranthene		13	U	13	41
		5.5	U	5.5	31
Fluorene		12	U	12	31
Indeno[1,2,3-cd]pyrene		12	U	12	100
Naphthalene		12	Ü	12	41
Phenanthrene		. –	Ŭ	12	41
Pyrene		12	J	•	
Surrogate		%Rec	Qualifier		tance Limits
Tambonid d14 (SUID)		87		72 - 11	15

87



## **Analytical Data**

Job Number: 280-39178-1

Sdg Number: JP0481

Client Sample ID:

J1RFN4

Client: Washington Closure Hanford

Lab Sample ID:

280-39178-3

Client Matrix:

Solid

02/25/2013 1953

% Moisture:

3.5

Date Sampled: 02/20/2013 1107 Date Received: 02/22/2013 1000

## 8310 PAHs (HPLC)

Analysis Method: Prep Method:

Analysis Date:

Dilution:

8310 3550C 1.0

Analysis Batch: Prep Batch:

280-161891 280-161725 Instrument ID: Initial Weight/Volume:

Final Weight/Volume: Injection Volume: Result Type:

CHHPLC\_G 31.5 g 4000 ul. 20 uL

**PRIMARY** 

Prep Date: 02/22	/2013 2025		Resu	itt Type:	PRIMARY
	5 184 O. — stad: V	Result (ug/Kg)	Qualifier	MDL	RL
Analyte	DryWt Corrected: Y	9.9	U	9.9	99
Acenaphthene			Ü	8.9	99
Acenaphthylene		8.9	Ü	3.0	20
Anthracene		3.0	Ü	3.1	15
3enzo[a]anthracene		3.1	U	6.3	15
Benzo[a]pyrene		6.3	-	4.1	15
Benzo[b]fluoranthene		4.1	U	7.1	30
Benzo[g,h,i]perylene		7.1	U	3.9	15
Benzo[k]fluoranthene		3.9	U	4.8	39
Chrysene		4.8	U		30
Dibenzo(a,h)anthracene		11	U	11	39
Fluoranthene		13	U	13	30
Fluorene		5.2	U	5.2	
Indeno[1,2,3-cd]pyrene		12	U	12	30
		12	U	12	99
Naphthalene		12	U	12	39
Phenanthrene		12	U	12	39
Pyrene		· <del>-</del>			
C		%Rec	Qualifier		eptance Limits
Surrogate (CUE)		88		72 -	115
Terphenyl-d14 (SUR)					



# Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

## **CASE NARRATIVE**

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-39178-1

SDG #: JP0481 SAF#: RC-232

Date SDG Closed: February 22, 2013 Data Deliverable: 7 Day / Summary

CLIENT ID	<u>LAB ID</u> 280-39178-1	ANALYSES REQUESTED 6010/7471	ANALYSES PERFORMED 6010B/7471A
J1RFN3	280-39178-2	6010/7471/9056M/353.2/8310	6010B/7471A/9056M/353.2/8310
J1RFN4	280-39178-3	6010/7471/9056M/353.2/8310	6010B/7471A/9056M/353.2/8310

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate,

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

#### RECEIPT

The samples were received on 2/22/2013 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.9° C.

### HPLC - SW846 8310 - PAHs

No anomalies were encountered.

#### TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-161812 indicates that physical and chemical interferences are present for Aluminum. Results have been flagged with an "X".

Low levels of Cadmium are present in the method blank associated with batch 280-161812. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-161812, and the associated sample results have been flagged "N". Silicon is a poor performer and has a history of reacting inconsistently. Data are reported as is.

It can be noted that the sample amount was greater than four times the spike amount for Iron in the Matrix Spike performed on sample J1RFN2: therefore, control limits are not applicable.

Aluminum was recovered outside the control limits in the Matrix Spike performed on sample J1RFN2, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

The duplicate analysis of sample J1RFN2 exhibited RPD data outside the control limits for Lead, Manganese, Vanadium, Zinc and Iron, and the associated sample results have been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

Antimony is present at a level greater than the reporting limit in the instrument blank associated with analysis batch 280-162255. As Antimony is not present at a level greater than the reporting limit in the associated samples, corrective action is deemed unnecessary.

No other anomalies were encountered.

## GENERAL CHEMISTRY - MCAWW 353.2 - NITRATE NITRITE as N

The Matrix Spike performed on sample J1RFN4 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

The duplicate analysis of sample J1RFN4 exceeded the RPD limit, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

#### **GENERAL CHEMISTRY - SW846 9056M - ANIONS**

The Orthophosphate as P Matrix Spike performed on sample J1RFN3 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

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SAMPLE AND PROCESSESSION  SAMPLE AND PROCESS	CE Chest No. 1.1 C 14-17	Waste Sites - Sou Full P	1-	ok No.		COA 0603032000		Method of Shirmen	. Ged	
SAMPLE MALANDS Secretarians of the control of the c	Shipped To Real	Signal Control	Offsite Pro		1207	e.		Bill of Lading/Air		J
Complete	POSSIBLE SAMPLE HAZARI	DS/REMARKS	skie	T. C.	Cool 4C	Cool 4C	Coel 4C			-
Sumple No.   Notice   Standard in header.   No. of Constituent (i)   1   1   1   1   1   1   1   1   1	humans and/or the environment			roe of Container	a/o	G/P	Q			+
SAMPLE ANALYSIS   Sample Date   Sample Time   Sample Tim	Special Handling and/or Sto	rage of in Leader	ž	, of Container(s)	1	-	-			+
Sample No.   Marit *   Sample Date   Sample Time *   Sample	Matrian preservation as maicas	eu in recivier.	_	Volume	125mL	125mL	125mL			+
Solid		SAMPLE ANALYSI	SI		See tree (1) in Special Instructions.	See item (3) in Special Latractions	PAIS-4310			
SOIL   2/20/13   1/03   X   X   X   X   X   X   X   X   X	Sample No.	Matrix *	Sample Date	Sample Time		ないのである。		STATE STATE OF THE		
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# Appendix 5 Data Validation Supporting Documentation

VALIDATION LEVEL:	A	В	С	D	Е
PROJECT:	600-30)		DATA PACKAG	GE: JP04	8/
VALIDATOR:	巨UL	LAB: THE	70-392	DATE: 4/	14/13
VALDATION	DUC	-0.0	SDG:	JP0481	
		ANALYSES	PERFORMED		
8015	8021	8141	8151	8315	(9310)
0010		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MA	TRIX				
	na tir	2 EN4			
JIKEN	73 11				
					Soil
					Soil
Technical verific	PACKAGE COME	n present?	•••••		$\wedge$
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Technical verific	cation documentation	n present?	•••••		$\wedge$
Technical verific	cation documentation	n present?			$\wedge$
Comments:	cation documentation	n present?	ΓΙΟΝ (Levels D aı	nd E)	Y(\$ No N/.
Comments:  Initial calibratic	RUMENT TUNING	n present?	ΓΙΟΝ (Levels D ar	nd E)	Yes No N/
Comments:  INSTI Initial calibratic	RUMENT TUNING ons acceptable?	a AND CALIBRA	ΓΙΟΝ (Levels D ar	nd E)	Yes No N/Yes No N/Yes No N/
Comments:  INSTE Initial calibratio Continuing cali Standards trace	RUMENT TUNING ons acceptable? able?	and Calibra	TION (Levels D a	nd E)	Yes No N/Yes No N/Yes No N/Yes No N/Yes No N/
2. INSTE Initial calibratic Continuing cali Standards trace: Standards expir	RUMENT TUNING ons acceptable? brations acceptable? able?	a AND CALIBRA	ΓΙΟΝ (Levels D ar	nd E)	Yes No N/ Yes No N Yes No N Yes No N Yes No N
2. INSTE Initial calibratic Continuing cali Standards trace: Standards expir Calculation che	RUMENT TUNING ons acceptable? brations acceptable? able?	a AND CALIBRA	ΓΙΟΝ (Levels D aı	nd E)	Yes No N/A  Yes No N/A

3. BLANKS (Levels B, C, D, and E)	Ves No No
Calibration blanks analyzed? (Levels D, E)	Ves No N/A
Calibration blank results acceptable? (Levels D, E)	Yes No N/A
Laboratory blanks analyzed?	Yes No N/A
Laboratory blanks analyzed?  Laboratory blank results acceptable?  The laboratory blank results acceptable?	Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E)	
Field/trip blank results acceptable? (Levels C, D, E)	Yes No NA
Transcription/calculation errors? (Levels D, E)	res No (NA)
Comments:	<u> </u>
4. ACCURACY (Levels C, D, and E)	Xes No N/A
Surrogates/system monitoring compounds analyzed?	X-X
Surrogate/system monitoring compound recoveries acceptable?	Voc. No. N/A
Surrogates traceable? (Levels D, E)	Van No N/A
Surrogates expired? (Levels D, E)	Ves No N/A
MS/MSD samples analyzed?	Yes No N/A
MS/MSD results acceptable?	
MS/MSD standards NIST traceable? (Levels D, E)	Yes No N/A
MS/MSD standards expired? (Levels D, E)	
LCS/BSS samples analyzed?	No N/A
LCS/BSS results acceptable?	Yee No N/A
Standards traceable? (Levels D, E)	Yes No MA
Standards expired? (Levels D, E)	Yes No N/A
Transcription/calculation errors? (Levels D, E)	Yes No (N/A
Performance audit sample(s) analyzed?	Yet No N/A
Performance audit sample results acceptable?	Yes No N/A
Comments:	no BHS

5.	PRECISION (Levels C, D, and E)	(i) y y/4
Dupl	licate RPD values acceptable?	Xes No N/A
Dupl	licate results acceptable?	Yel No NA
MS/I	MSD standards NIST traceable? (Levels D, E)	Yes No N/A
MS/I	MSD standards expired? (Levels D, E)	Yes No (N/A)
Field	d duplicate RPD values acceptable?	Yes No DIA
Field	d split RPD values acceptable?	Yes NO INA
Tran	nscription/calculation errors? (Levels D, E)	Yes No N/A
	mments:	
6.	HOLDING TIMES (all levels)	(V) No N/A
San	mples properly preserved?	Yes No N/A
San	mple holding times acceptable?	
Cor	mments:	

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DI	ETECTION LIMITS (an
levels)	Jan N/A
Results reported for all requested analyses?	Yes No NA
Results supported in the raw data? (Levels D, E)	Yes No N/A
Samples properly prepared? (Levels D, E)	Yes No N/A
Detection limits meet RDL?	Yes No N/A
Transcription/calculation errors? (Levels D, E)	
Comments:	
	_
	$\wedge$
9. SAMPLE CLEANUP (Levels D and E)	Ves Nd NA
Fluoricil ® (or other aborbant) cleanup performed?	Yes No N/A
Lot check performed?	Yes NV NVA
Check recoveries aceptable?	Yes No N/A
Check materials traceable?	Yes No N/A
Check materials Expired?	Yes No N/A
Analytical batch QC given similar cleanup?	Yes No N/A
Transcription/Calculation Errors?	Yes No N/A
Comments:	

# Appendix 6 Additional Documentation Requested by Client

## **Quality Control Results**

Job Number: 280-39178-1

Sdg Number: JP0481

Method Blank - Batch: 280-161725

Client: Washington Closure Hanford

Method: 8310 Preparation: 3550C

Lab Sample ID: Client Matrix:

Dilution:

MB 280-161725/1-A Solid 1.0

02/25/2013 1720

Analysis Batch: Prep Batch: Leach Batch: Units:

280-161891 280-161725 N/A ug/Kg

Instrument ID:

Lab File ID: Initial Weight/Volume: Final Weight/Volume: Injection Volume:

CHHPLC\_G G0225014.D 31.1 g 4000 uL

02/22/2013 2025 Prep Date:

Leach Date:

Analysis Date:

Column ID:

20 uL PRIMARY

Analyte	Result	Qual	MDL	RL
	9.6	U	9.6	96
Acenaphthene		บ	8.7	96
Acenaphthylene	8.7	ŭ	2.9	19
Anthracene	2.9	Ü	3.1	14
Benzo[a]anthracene	3.1	U	6.2	14
Benzo(a)pyrene	6.2	-	4.1	14
Benzo[b]fluoranthene	4.1	U	6.9	29
Benzo[g,h,i]perylene	6.9	U		14
Benzo[k]fluoranthene	3.8	U	3.8	39
Chrysene	4.7	U	4.7	29
Dibenzo(a,h)anthracene	11	U	11	<del>-</del> -
Fluoranthene	13	U	13	39
Fluorene	5.1	U	5.1	29
	12	U	12	29
indeno[1,2,3-cd]pyrene	12	U	12	96
Naphthalene	12	U	12	39
Phenanthrene	12	U	12	39
Pyrene	12	-		
Surrogate	% Rec		Acceptance Limits	
Temberyl-d14 (SUR)	88		72 - 115	

Terphenyl-d14 (SUR)

## **Quality Control Results**

Job Number: 280-39178-1

Sdg Number: JP0481

Lab Control Sample - Batch: 280-161725

Client: Washington Closure Hanford

Method: 8310 Preparation: 3550C

Lab Sample ID: Client Matrix: Dilution: Analysis Date: LCS 280-161725/2-A Solid 1.0

02/25/2013 1751

02/22/2013 2025

Analysis Batch: Prep Batch: Leach Batch: Units: 280-161891 280-161725 N/A ug/Kg Instrument ID: Lab File ID: Initial Weight/Volume: Final Weight/Volume: Injection Volume:

Column ID:

CHHPLC\_G G0225015.D 30.8 g 4000 uL 20 uL PRIMARY

Prep Date: Leach Date:

N/A

A 1. da	Spike Amount	Result	% Rec.	Limit	Qual
Analyte	1950	1750	90	78 - 116	
Acenaphthene		1690	87	76 - 115	
Acenaphthylene	1950		88	74 - 115	
Anthracene	1950	1710	91	85 - 120	
Benzo[a]anthracene	1950	1770	* *	74 - 121	
Benzo[a]pyrene	1950	1710	88		
Benzo[b]fluoranthene	1950	1810	93	85 - 115	
Benzo(g,h,i)perylene	1950	1840	94	85 - 120	
Benzo[k]fluoranthene	1950	1860	95	85 - 115	
	1950	1780	91	83 - 115	
Chrysene	1950	1820	93	83 - 115	
Dibenzo(a,h)anthracene	1950	1850	95	83 - 115	
Fluoranthene		1750	90	80 - 115	
Fluorene	1950	1780	91	85 - 123	
Indeno[1,2,3-cd]pyrene	1950		94	80 - 121	
Naphthalene	1950	1830		80 - 115	
Phenanthrene	1950	1840	94	= -	
Pyrene	1950	1740	90	75 - 116	
Surrogate	%	Rec		Acceptance Limits	

Terphenyl-d14 (SUR)

88

72 - 115

## **Quality Control Results**

Job Number: 280-39178-1

Sdg Number: JP0481

Matrix Spike/ Matrix Spike Duplicate Recovery Report - Batch: 280-161725 Method: 8310 Preparation: 3550C

Initial Weight/Volume:

Final Weight/Volume:

Injection Volume:

MS Lab Sample ID: Client Matrix: Dilution:

Analysis Date:

Prep Date:

Leach Date:

280-39178-2 Solld

Client: Washington Closure Hanford

1.0 02/25/2013 1852

02/22/2013 2025

MSD Lab Sample ID: Client Matrix: Dilution:

Solid 1.0

02/25/2013 1923 Analysis Date: 02/22/2013 2025 Prep Date: N/A

Leach Date:

280-39178-2

Analysis Batch: Prep Batch: Leach Batch:

Analysis Batch:

Prep Batch:

Leach Batch:

280-161891 280-161725 N/A

280-161891

280-161725

N/A

Instrument ID: Lab File ID: Initial Weight/Volume:

Instrument ID:

Lab File ID:

Column ID:

Final Weight/Volume: Injection Volume: Column ID:

G0225017.D 31.4 g 4000 uL 20 uL PRIMARY

CHHPLC\_G

CHHPLC\_G G0225018.D 30.3 g 4000 uL

20 uL PRIMARY

	<u>%</u> MS	Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qua
Analyte	IVIO	MOD					
Acenaphthene	86	93	78 - 116	12	20		
Acenaphthylene	84	77	76 - 115	5	21		
Anthracene	87	86	74 - 115	2	20		
Benzo[a]anthracene	89	89	85 - 120	3	20		
Benzo(a)pyrene	87	88	74 - 121	5	20		
* * * *	91	94	85 - 115	7	20		
Benzo[b]fluoranthene	92	92	85 - 120	4	20		
Benzo[g,h,i]perylene	93	93	85 - 115	4	20		
Benzo[k]fluoranthene	89	89	83 - 115	4	20		
Chrysene	91	91	83 - 115	4	20		
Dibenzo(a,h)anthracene		94	83 - 115	4	20		
Fluoranthene	93	= :	80 - 115	1	20		
Fluorene	88	84		6	20		
indeno[1,2,3-cd]pyrene	89	91	85 - 123				
Naphthalene	92	87	80 - 121	2	20		
Phenanthrene	92	93	80 - 115	5	20		
Pyrene	88	88	75 - 116	4	20		
Surrogate		MS % Rec	MSD % Rec		Acceptance Limits		its
Terphenyl-d14 (SUR)		90	89			72 - 115	

Date:

15 April 2013

To:

Washington Closure Hanford Inc. (technical representative)

From:

**ELR Consulting** 

Project:

100-IU-2 & 100-IU-6 Remaining Waste Sites - Soil Full Protocol - Waste Site

600-303

Subject: Wet Chemistry - Data Package No. JP0481-TAL

### INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0481 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte	
J1RFN3	2/20/13	Soil	С	See note 1	
J1RFN4	2/20/13	Soil	С	See note 1	

<sup>1 –</sup> IC anions by 300.0, nitrate/nitrite by 353.2.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

Appendix 6. Additional Documentation Requested by Client

#### DATA QUALITY PARAMETERS

#### Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: 28 days for nitrate/nitrite, chloride, fluoride, bromide, sulfate; and 48 hours for nitrate, nitrite and orthophosphate.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by greater than twice the limit, all undetected nitrate, nitrite and orthophosphate results were qualified as rejected and flagged "UR". Due to the holding time being exceeded by greater than twice the limit, all detected nitrate, nitrite and orthophosphate results were qualified as estimates and flagged "J".

All other holding times were acceptable.

#### Method Blanks

## Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

## Field Blanks

No field blanks were submitted for analysis.

## Accuracy

## Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

#### Precision

## Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate

analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

## Field Duplicate

One set of field duplicates (J1RFN3/J1RFN4) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

## Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

## Completeness

Data package JP0481 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 75%.

## **MAJOR DEFICIENCIES**

The following major deficiency was noted:

Due to the holding time being exceeded by greater than twice the limit, all
undetected nitrate, nitrite and orthophosphate results were qualified as rejected and
flagged "UR".

Rejected data is unusable and should not be reported.

## MINOR DEFICIENCIES

The following minor deficiencies were noted:

 Due to the holding time being exceeded by greater than twice the limit, all detected nitrate, nitrite and orthophosphate results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

## **REFERENCES**

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*.

DOE/RL-96-22, Rev. 5, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, September 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

# WET CHEMISTRY DATA QUALIFICATION SUMMARY\*

SDG: JP0481 REVIEWER: ELR		Project: 600-303	PAGE_1_OF_1	
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON	
Orthophosphate	J	All	Hold time	
Nitrate Nitrite	UR	All .	Hold time	

<sup>\* -</sup> The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

# Appendix 3 Annotated Laboratory Reports

Client: Washington Closure Hanford Job Number: 280-39178-1
Sdg Number: JP0481

3.9

**General Chemistry** 

Client Sample ID:

J1RFN3

Lab Sample ID:

280-39178-2

Client Matrix: Solid

% Moisture:

Date Sampled: 02/20/2013 1107

Date Received: 02/22/2013 1000

Analyte	Result	Qual	Units	MDL	RL	DII	Method
Nitrate Nitrite as N-Soluble	2.5	· · · · · · · · · · · · · · · · · · ·	mg/Kg	0.33	0.81	1.0	353.2
Analysis Batch:	280-161940	Analysis Date:	02/25/2013	1333			DryWt Corrected: Y
Chloride-Soluble	4.9	В	mg/Kg	2.0	5.1	1.0	9056M
Analysis Batch:	280-162031	Analysis Date:	02/25/2013			DryWt Corrected: Y	
Nitrate as N-Soluble	0.32	UR	mg/Kg	0.32	2.6	1.0	9056M
Analysis Batch:	280-162032	Analysis Date		1641	•		DryWt Corrected: Y
Bromide-Soluble	0.40	Ū	mg/Kg	0.40	2.0	1.0	9056M
Analysis Batch:	280-162031	Analysis Date	: 02/25/2013	1641			DryWt Corrected: Y
Nitrite as N-Soluble	0.34		mg/Kg	0.34	2.6	1.0	9056M
Analysis Batch:	280-162032	Analysis Date		1641			DryWt Corrected: Y
Orthophosphate as P-Soluble	2.4	BN	mg/Kg	1.3	5.1	1.0	9056M
Analysis Batch:	280-162032	Analysis Date		1641			DryWt Corrected: Y
Sulfate-Soluble	4.1	В	mg/Kg	1.8	5.1	1.0	9056M
Analysis Batch:	280-162031	Analysis Date: 02/25/2013 1641					DryWt Corrected: Y
Fluoride-Soluble	1.2	В	mg/Kg	0.84	5.1	1.0	9056M
Analysis Batch:		Analysis Date: 02/25/2013 1641					DryWt Corrected: Y
Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	3.9		%	0.10	0.10	1.0	D-2216
Analysis Batch:	280-162134	Analysis Date	: 02/26/2013	3 1450			DryWt Corrected: N

Vylights

Job Number: 280-39178-1 Client: Washington Closure Hanford Sdg Number: JP0481

**General Chemistry** 

Client Sample ID:

J1RFN4

Lab Sample ID:

280-39178-3

Solid

% Moisture:

Date Sampled: 02/20/2013 1107

Date Received: 02/22/2013 1000

Client Matrix:	Solid	% Moisture: 3.5			Date Received: 02/22/2013 1000		
Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as I	N-Soluble 1.7	MN	mg/Kg	0.30	0.76	1.0	353.2
	Analysis Batch: 280-161940	Analysis Date:	02/25/2013	1335			DryWt Corrected: Y
Chloride-Soluble	5.4	•	mg/Kg	2.0	5.1	1.0	9056M
Official Coldsid	Analysis Batch: 280-162031	Analysis Date:	Analysis Date: 02/25/2013 1731				
Nitrate as N-Solu	•	΄ υ <b>ʹ</b> ʹ	mg/Kg	0.32	2.6	1.0	9056M
111000000000000000000000000000000000000	Analysis Batch: 280-162032	Analysis Date:		1731			DryWt Corrected: Y
Bromide-Soluble	0.40	· U	mg/Kg	0.40	2.1	1.0	9056M
	Analysis Batch: 280-162031	Analysis Date:	02/25/2013	1731			DryWt Corrected: Y
Nitrite as N-Solut	•	້ ປີີ¥″	mg/Kg	0.34	2.6	1.0	9056M
1410110 00 14 00100	Analysis Batch: 280-162032	Analysis Date:		1731			DryWt Corrected: Y
Orthonhosphate :	as P-Soluble 3.1		mg/Kg	1.3	5.1	1.0	9056M
Charophoophace	Analysis Batch: 280-162032	Analysis Date:		1731			DryWt Corrected: Y
Sulfate-Soluble	3.7	B	mg/Kg	1.8	5.1	1.0	9056M
Canalo Colabio	Analysis Batch: 280-162031	Analysis Date:	02/25/2013	1731			DryWt Corrected: Y
Fluoride-Soluble	1.1	В		0.84	5.1	1.0	9056M
	Analysis Batch: 280-162031	Analysis Date: 02/25/2013 1731					DryWt Corrected: Y
Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	3.5		%	0.10	0.10	1.0	D-2216
	Analysis Batch: 280-162134	Analysis Date:	02/26/2013	1450			DryWt Corrected: N

4/14/13

# Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

#### **CASE NARRATIVE**

**Client: Washington Closure Hanford** 

**Project: WASHINGTON CLOSURE HANFORD** 

Report Number: 280-39178-1

SDG #: JP0481 SAF#: RC-232

Date SDG Closed: February 22, 2013
Data Deliverable: 7 Day / Summary

CLIENT ID J1RFN2	<u>LAB ID</u> 280-39178-1	ANALYSES REQUESTED 6010/7471	ANALYSES PERFORMED 6010B/7471A
J1RFN3	280-39178-2	6010/7471/9056M/353.2/8310	6010B/7471A/9056M/353.2/8310
JIRFN4	280-39178-3	6010/7471/9056M/353.2/8310	6010B/7471A/9056M/353.2/8310

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

#### RECEIPT

The samples were received on 2/22/2013 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.9° C.

#### HPLC - SW846 8310 - PAHs

No anomalies were encountered.

#### TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-161812 indicates that physical and chemical interferences are present for Aluminum. Results have been flagged with an "X".

Low levels of Cadmium are present in the method blank associated with batch 280-161812. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-161812, and the associated sample results have been flagged "N". Silicon is a poor performer and has a history of reacting inconsistently. Data are reported as is.

It can be noted that the sample amount was greater than four times the spike amount for Iron in the Matrix Spike performed on sample J1RFN2; therefore, control limits are not applicable.

Aluminum was recovered outside the control limits in the Matrix Spike performed on sample J1RFN2, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

The duplicate analysis of sample J1RFN2 exhibited RPD data outside the control limits for Lead, Manganese, Vanadium, Zinc and Iron, and the associated sample results have been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

Antimony is present at a level greater than the reporting limit in the instrument blank associated with analysis batch 280-162255. As Antimony is not present at a level greater than the reporting limit in the associated samples, corrective action is deemed unnecessary.

No other anomalies were encountered.

#### GENERAL CHEMISTRY - MCAWW 353.2 - NITRATE NITRITE as N

The Matrix Spike performed on sample J1RFN4 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

The duplicate analysis of sample J1RFN4 exceeded the RPD limit, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

### GENERAL CHEMISTRY - SW846 9056M - ANIONS

The Orthophosphate as P Matrix Spike performed on sample J1RFN3 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

WCH-EE-011

Washington Closur	e Hanford	C	HAIN OF CUST	ODY/S	AMPLE	ANALY	SIS RI	EQUEST		RC-	232-008	Page 1	a r
ollector Brackett, R	VIABIOIE	Comp	any Contact n Kessner	Telepho	ne No. 75-4688		Project Coordinator KESSNER, JH Price Code 8C 8			B Data Turnaround  7 15 Days 34 44013			
olect Designation 100-IU-2 & 100-IU-6 Remain	ning Waste Sites - Soil Ful		ling Location 3-303				RC	F No. 3-232			<del> </del>	844	puli3
	2-017-6	Field	Lógbook No. -1666		COA 060303200	ю		thod of Ship			EX		
nipped To TestAmerica Incorporated, R	ishedis DENUER	Offsi	e Property No.	+120	ماما 1	,	В	Il of Lading/	Air Bill I	Su	05	PC_	1
OSSIBLE SAMPLE HAZA lay contain hazardous substa	RDS/REMARKS		Preservation	Coal 4C	Cost 4C	Cool 4C		İ		<u> </u>			
rumans and/or the environmen	st.		Type of Container	G/P	G/P	aG.							-
Special Handling and/or S daintain preservation as indic	cated in header.	•	No. of Container(s)	1	1	1	1. 1.	_			-	-	-
•			Volume	125mL	125mL	125mL							_
*	SAMPLE ANALY	SIS		See item (1) is Special Instructions	See item (2) in Special Instructions	PAHs - 8310							
Sample No.	Matrix *	Sample Date	Sample Time				No.		SASE.			DEC 15	8830
1RFN2	SOIL	2/20/1	3 1055	X			By 20"	>	_		-	-	+-
1RFN3	SOIL	2/20/1	Name and Address of the Owner, where the Owner, which is	X	1	×		-	-		-	+	+
1RFN4	SOIL	2/20/	13 1107	×	×		-	+		_			
				1									Matrix
CHAIN OF POSSESSIV	Date/Time 114% 220-13 Date/Time	Received By/S BANDOO	Software 21 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1	Date/Time  Old   13   15    Date/Time   10    Date/Time  Date/Time  Date/Time	(1) Cade Nick (Mc (2) Pho	mium, Calcium, cal, Potassium, S reury) IC Anions - 905 sphorous in pho- 5- (phi Measurer	OlOTR (Close Chromium, Scienium, Sil 56 Modified subate, Sulfi	o-oot List) (Alam Cobalt, Copper, icom, Silvar, Soc (Bromide, Chlor to); NOZ/NO3 - , 212 412	iron, Lead jum, Vana	imony, Arsenie, I , Magnesium, Ma diam, Zino); Mer de, Nitrogen in Nitrite s	cory - 7471 - ( strate, Nitrogen and Nitrate); pl	CV)	9-5ofi SD-Sofime SO-Sofie SI-Sofie W = West O-Dil A-Air Di-Drem V-Times V/-Vige L-L-Lund V-Vige L-L-Lund V-Vige X-Other
LABORATORY Received	Ву				Title					1236	3	Date/Time	
SECTION		ASS - 17 - 184 - 1 - 184 - 184		_			posed By						

# Appendix 5

**Data Validation Supporting Documentation** 

VALIDATION A B C D E  PROJECT: COO-303 DATA PACKAGE: TPOUR  VALIDATOR: FUR LAB: A DATE: U U 3  SDG: TPOUR  ANALYSES PERFORMED  Anions/IC TOC TOX TPH-418.1 Oil and Grease Alkalinity  Minimonia BOD/COD Chloride Chromium-VI pH (Oy/NO2)  Sulfate TDS TKN Phosphate  SAMPLES/MATRIX  JIRFUJ JIRFUJ  I. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE  Technical verification documentation present?  Comments:  2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)  Initial calibrations performed on all instruments?  Yes No N/A  Initial calibrations acceptable?  ICV and CCV checks performed on all instruments?  Yes No N/A  Standards traceable?  Yes No N/A  Standards caceptable?  Yes No N/A  Standards expired?  Yes No N/A						
SDG: TPOUS  ANALYSES PERFORMED  Anions/IC TOC TOX TPH-418.1 Oil and Grease Alkalinity  Anions/IC TOC TOX TPH-418.1 Oil and Grease Alkalinity  Sulfate TDS TKN Phosphate  SAMPLES/MATRIX  JIRFU3 JIRFU3  I. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE  Technical verification documentation present?  Comments:  2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)  Initial calibrations performed on all instruments?  Yes No N/A  ICV and CCV checks acceptable?  Yes No N/A  Standards traceable?  Yes No N/A  Standards traceable?  Yes No N/A  Standards expired?  Yes No N/A	I '	A	В	C	D	E
ANALYSES PERFORMED  Anions/IC TOC TOX TPH-418.1 Oil and Grease Alkalinity  Ammonia BOD/COD Chloride Chromium-VI pH (O <sub>3</sub> /NO <sub>2</sub> )  Sulfate TDS TKN Phosphate  SAMPLES/MATRIX  JIRFU3 JIRFU4  I. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE  Technical verification documentation present?  Comments:  2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)  Initial calibrations performed on all instruments?  Yes No N/A  ICV and CCV checks acceptable?  Yes No N/A  Standards traceable?  Yes No N/A  Standards expired?  Yes No N/A  Standards expired?  Yes No N/A  Standards expired?  Yes No N/A  SIGNARD STANDARD STAND	PROJECT: (	,00-303		DATA PACKAG	E: JPOU	(8)
ANALYSES PERFORMED  Anions/IC TOC TOX TPH-418.1 Oil and Grease Alkalinity  Ammonia BOD/COD Chloride Chromium-VI pH (O <sub>2</sub> /NO <sub>2</sub> )  Sulfate TDS TKN Phosphate  SAMPLES/MATRIX  JIRFUJ JIRFUJ  I. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE  Technical verification documentation present?  Comments:  2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)  Initial calibrations acceptable?  ANALYSES PERFORMED  Oil and Grease Alkalinity  FOO NO  NO  NO  NO  NO  NO  NO  NO  NO  N				L	DATE: 4	14/13
Anions/IC TOC TOX TPH-418.1 Oil and Grease Alkalinity  Ammonia BOD/COD Chloride Chromium-VI pH (Os/No2)  Sulfate TDS TKN Phosphate  SAMPLES/MATRIX  JIRFUJ JIRFUJ  I. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE  Technical verification documentation present?				SDG: 37	20491	
SAMPLES/MATRIX  JIRFUJ JIRFUJ  SOLI  I. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE Technical verification documentation present?  Comments:  Linitial calibrations performed on all instruments?  Linitial calibrations acceptable?  Yes No N/A  LICV and CCV checks performed on all instruments?  Yes No N/A  Standards traceable?  Yes No N/A  Standards expired?  Yes No N/A			ANALYSES 1	PERFORMED		
SAMPLES/MATRIX  JIRFUS  TIRFUS  SOLI  I. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE Technical verification documentation present?  Comments:  2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E) Initial calibrations performed on all instruments?  Per No N/A Initial calibrations acceptable?  Yes No N/A ICV and CCV checks performed on all instruments?  Yes No N/A Standards traceable?  Yes No N/A Standards traceable?  Yes No N/A Standards expired?  Yes No N/A	Anions/IC	TOC	тох	TPH-418.1	Oil and Grease	Alkalinity
SAMPLES/MATRIX  JIRFUS JIRFUS  SOIL  1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE Technical verification documentation present? Yellow N/A  Comments:  2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E) Initial calibrations performed on all instruments? Yes No N/A  Initial calibrations acceptable? Yes No N/A  ICV and CCV checks performed on all instruments? Yes No N/A  ICV and CCV checks acceptable? Yes No N/A  Standards traceable? Yes No N/A  Standards traceable? Yes No N/A  Calculation check acceptable? Yes No N/A  Calculation check acceptable? Yes No N/A  Calculation check acceptable? Yes No N/A	Ammonia	BOD/COD	Chloride	Chromium-VI	pН	NO <sub>3</sub> /NO <sub>2</sub>
I. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE Technical verification documentation present?  2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E) Initial calibrations performed on all instruments?  Initial calibrations acceptable?  ICV and CCV checks performed on all instruments?  ICV and CCV checks acceptable?  Yes No N/A  Standards traceable?  Yes No N/A  Standards expired?  Yes No N/A  Calculation check acceptable?  Yes No N/A	Sulfate	TDS	TKN	Phosphate		
I. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE Technical verification documentation present?  2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E) Initial calibrations performed on all instruments?  Initial calibrations acceptable?  ICV and CCV checks performed on all instruments?  ICV and CCV checks acceptable?  Yes No N/A  Standards traceable?  Yes No N/A  Standards expired?  Yes No N/A  Calculation check acceptable?  Yes No N/A						
1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE Technical verification documentation present? Yee No N/A Comments:  2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E) Initial calibrations performed on all instruments? Yes No N/A Initial calibrations acceptable? Yes No N/A ICV and CCV checks performed on all instruments? Yes No N/A ICV and CCV checks acceptable? Yes No N/A Standards traceable? Yes No N/A Calculation check acceptable? Yes No N/A Calculation check acceptable? Yes No N/A	SAMPLES/MAT	RIX				.1
1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE Technical verification documentation present? Yee No N/A Comments:  2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E) Initial calibrations performed on all instruments? Yes No N/A Initial calibrations acceptable? Yes No N/A ICV and CCV checks performed on all instruments? Yes No N/A ICV and CCV checks acceptable? Yes No N/A Standards traceable? Yes No N/A Calculation check acceptable? Yes No N/A Calculation check acceptable? Yes No N/A	JIRF	んつ	TIRENY			
1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE Technical verification documentation present? Yes No N/A Comments:  2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E) Initial calibrations performed on all instruments? Yes No N/A Initial calibrations acceptable? Yes No N/A ICV and CCV checks performed on all instruments? Yes No N/A Standards traceable? Yes No N/A Standards expired? Yes No N/A Calculation check acceptable? Yes No N/A Calculation check acceptable? Yes No N/A			)   1 / 2			
1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE Technical verification documentation present? Yes No N/A Comments:  2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E) Initial calibrations performed on all instruments? Yes No N/A Initial calibrations acceptable? Yes No N/A ICV and CCV checks performed on all instruments? Yes No N/A Standards traceable? Yes No N/A Standards expired? Yes No N/A Calculation check acceptable? Yes No N/A Calculation check acceptable? Yes No N/A		· · · · · · · · · · · · · · · · · · ·				
1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE Technical verification documentation present? Yes No N/A Comments:  2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E) Initial calibrations performed on all instruments? Yes No N/A Initial calibrations acceptable? Yes No N/A ICV and CCV checks performed on all instruments? Yes No N/A Standards traceable? Yes No N/A Standards expired? Yes No N/A Calculation check acceptable? Yes No N/A Calculation check acceptable? Yes No N/A						
1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE Technical verification documentation present? Yes No N/A Comments:  2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E) Initial calibrations performed on all instruments? Yes No N/A Initial calibrations acceptable? Yes No N/A ICV and CCV checks performed on all instruments? Yes No N/A Standards traceable? Yes No N/A Standards expired? Yes No N/A Calculation check acceptable? Yes No N/A Calculation check acceptable? Yes No N/A						
Technical verification documentation present? Yes No N/A  Comments:  2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)  Initial calibrations performed on all instruments? Yes No N/A  Initial calibrations acceptable? Yes No N/A  ICV and CCV checks performed on all instruments? Yes No N/A  ICV and CCV checks acceptable? Yes No N/A  Standards traceable? Yes No N/A  Standards expired? Yes No N/A  Calculation check acceptable? Yes No N/A						Soil
Technical verification documentation present? Yes No N/A  Comments:  2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)  Initial calibrations performed on all instruments? Yes No N/A  Initial calibrations acceptable? Yes No N/A  ICV and CCV checks performed on all instruments? Yes No N/A  ICV and CCV checks acceptable? Yes No N/A  Standards traceable? Yes No N/A  Standards expired? Yes No N/A  Calculation check acceptable? Yes No N/A						
Z. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)  Initial calibrations performed on all instruments? Yes No N/A  Initial calibrations acceptable? Yes No N/A  ICV and CCV checks performed on all instruments? Yes No N/A  ICV and CCV checks acceptable? Yes No N/A  Standards traceable? Yes No N/A  Standards expired? Yes No N/A  Calculation check acceptable? Yes No N/A						<i>A</i>
2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E) Initial calibrations performed on all instruments? Yes No N/A Initial calibrations acceptable? Yes No N/A ICV and CCV checks performed on all instruments? Yes No N/A ICV and CCV checks acceptable? Yes No N/A Standards traceable? Yes No N/A Calculation check acceptable? Yes No N/A	Technical verificat	ion documentation	oresent?			Ye (No )N/A
Initial calibrations performed on all instruments?  Initial calibrations acceptable?  ICV and CCV checks performed on all instruments?  Yes No N/A  ICV and CCV checks acceptable?  Yes No N/A  Standards traceable?  Yes No N/A  Calculation check acceptable?  Yes No N/A  Yes No N/A	Comments:					
Initial calibrations performed on all instruments?  Initial calibrations acceptable?  ICV and CCV checks performed on all instruments?  Yes No N/A  ICV and CCV checks acceptable?  Yes No N/A  Standards traceable?  Yes No N/A  Calculation check acceptable?  Yes No N/A  Yes No N/A				· · · · · · · · · · · · · · · · · · ·		
Initial calibrations performed on all instruments?  Initial calibrations acceptable?  ICV and CCV checks performed on all instruments?  Yes No N/A  ICV and CCV checks acceptable?  Yes No N/A  Standards traceable?  Yes No N/A  Calculation check acceptable?  Yes No N/A  Yes No N/A						
Initial calibrations performed on all instruments?  Initial calibrations acceptable?  ICV and CCV checks performed on all instruments?  Yes No N/A  ICV and CCV checks acceptable?  Yes No N/A  Standards traceable?  Yes No N/A  Calculation check acceptable?  Yes No N/A  Yes No N/A	4 INCOMPAN					
Initial calibrations acceptable? Yes No N/A ICV and CCV checks performed on all instruments? Yes No N/A ICV and CCV checks acceptable? Yes No N/A Standards traceable? Yes No N/A Calculation check acceptable? Yes No N/A						( )
ICV and CCV checks performed on all instruments?  ICV and CCV checks acceptable?  Standards traceable?  Yes No N/A  Standards expired?  Yes No N/A  Calculation check acceptable?  Yes No N/A		performed on all in				/ /
ICV and CCV checks acceptable? Yes No N/A Standards traceable? Yes No N/A Standards expired? Yes No N/A Calculation check acceptable? Yes No N/A	T 1/1 1 111 /1	. 11.0				** ** * **
Standards traceable? Yes No N/A Standards expired? Yes No N/A Calculation check acceptable? Yes No N/A						,
Standards expired?	ICV and CCV chec	cks performed on al	l instruments?			Yes N/A
Calculation check acceptable?	ICV and CCV chec ICV and CCV chec	cks performed on alcks acceptable?	l instruments?			Yes No N/A
	ICV and CCV check ICV and CCV check Standards traceable	cks performed on all cks acceptable?	l instruments?			Yes No N/A Yes No N/A Yes No N/A
	ICV and CCV chect ICV and CCV chect Standards traceable Standards expired?	cks performed on al	l instruments?			Yes No N/AYes No N/AYes No N/AYes No N/A

vels D, E) Yes No N/A
Yes No N/A
no FR
Yes No N/A
Yes No NA
Yes No (N/A
No No
Yes No NV
Yes No No
Yes No NZ
Yes No N
Yes( No )
NO PH

Duplicate MS/MSD	RPD values acceptable?	Yes No N/A
MS/MSD	regulta accentable?	
MS/MSD	results acceptable:	
	standards NIST traceable? (Levels D, E)	Yes No NA
MS/MSD	standards expired? (Levels D, E)	Yos No W/A
Field dup	licate RPD values acceptable?	
Field split	t RPD values acceptable?	Yes No XIA
Transcrip	otion/calculation errors? (Levels D, E)	Yes No W/A
	ts:	
	HOLDING TIMES (all lavels)	
6.	HOLDING TIMES (all levels)	
Samples	properly preserved?	(Yes) No N/A
Samples	properly preserved?	Yes No N/A
Samples	properly preserved?	Yes No N/A
Samples	properly preserved?	Yes No N/A
Samples	properly preserved?	Yes No N/A
Samples	properly preserved?	Yes No N/A
Samples	properly preserved?	Yes No N/A
Samples	properly preserved?	Yes No N/A
Samples	properly preserved?	

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)	
Results reported for all requested analyses?	Yes No X
Results supported in the raw data? (Levels D, E)	Yes No N/A
Samples properly prepared? (Levels D, E)	Yes No N/A
Detection limits meet RDL?	Yes No N/A
Transcription/calculation errors? (Levels D, E)	Yes Nd N/A
Comments:	

# Appendix 6

Additional Documentation Requested by Client

Job Number: 280-39178-1

Sdg Number: JP0481

Method: 353.2 Method Blank - Batch: 280-161940 Preparation: N/A

Analysis Batch:

Prep Batch:

Units:

Lab Sample ID: Client Matrix:

MB 280-161878/1-A

Solid

1.0

Client: Washington Closure Hanford

Analysis Date: Prep Date:

Dilution:

02/25/2013 1330

Leach Date:

Analyte

N/A

02/25/2013 0954

280-161878 Leach Batch: mg/Kg

280-161940

Lab File ID:

Instrument ID:

WC Alp 2 C:\FLOW 4\0225NXNK

Initial Weight/Volume: Final Weight/Volume:

MDL RL

Nitrate Nitrite as N-Soluble

Result 0.30

Qual U

0.30

0.75

Method Reporting Limit Check - Batch: 280-161940

Method: 353.2

Preparation: N/A

Lab Sample ID:

MRL 280-161940/18

02/25/2013 1242

Analysis Batch: Prep Batch:

280-161940 N/A

instrument ID: Lab File ID:

WC Alp 2

Client Matrix: Dilution: Analysis Date: Water 1.0

Leach Batch: Units:

N/A mg/L

Initial Weight/Volume:

C:\FLOW\_4\0225NXNK 100 mL

100 mL Final Weight/Volume:

Prep Date: Leach Date: N/A N/A

Analyte Nitrate Nitrite as N-Soluble Spike Amount 0.100

Result 0.100 % Rec. 100

Limit 50 - 150 Qual

Lab Control Sample - Batch: 280-161940

Method: 353.2 Preparation: N/A

LCS 280-161878/2-A Lab Sample ID: Client Matrix:

Solid 1.0

Prep Batch: Leach Batch: Units:

Analysis Batch:

280-161940 N/A

280-161878 mg/Kg

Instrument ID: Lab File ID:

WC Alp 2 C:\FLOW\_4\0225NXNK

Initial Weight/Volume: Final Weight/Volume:

Analysis Date: Prep Date:

Dilution:

Analyte

N/A

Leach Date:

Nitrate Nitrite as N-Soluble

02/25/2013 0954

02/25/2013 1332

Spike Amount 49.5

Result 48.97 % Rec. 99

Limit

90 - 110

Qual

**TestAmerica Denver** 

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WC\_Alp 2

WC\_Alp 2

C:\FLOW\_4\0225NXNK

Client: Washington Closure Hanford

Job Number: 280-39178-1

C:\FLOW\_4\0225NXNK

Sdg Number: JP0481

Matrix Spike - Batch: 280-161940

Method: 353.2 Preparation: N/A

Lab Sample ID: Client Matrix:

280-39178-3

Solid

Dilution: Analysis Date: Prep Date:

1.0

02/25/2013 1338

Leach Date:

N/A

02/25/2013 0954

Analysis Batch: 280-161940 N/A

Prep Batch: Leach Batch: Units:

280-161878 mg/Kg

Instrument ID:

Lab File ID:

Initial Weight/Volume:

Final Weight/Volume:

Qual Analyte Sample Result/Qual Spike Amount Result % Rec. Limit Nitrate Nitrite as N-Soluble 1.7 52.9 42.33 77 90 - 110 Ν

Duplicate - Batch: 280-161940

Method: 353.2 Preparation: N/A

Lab Sample ID: Client Matrix:

Dilution:

Leach Date:

280-39178-3 Solid

1.0

Analysis Date: Prep Date:

02/25/2013 1336

02/25/2013 0954

Analysis Batch: Prep Batch:

N/A Leach Batch: 280-161878 Units:

mg/Kg

280-161940

Instrument ID:

Lab File ID:

Initial Weight/Volume:

Final Weight/Volume:

Analyte Sample Result/Qual Result RPD Limit Qual Nitrate Nitrite as N-Soluble 1.7 1.43 18 10 М

Job Number: 280-39178-1

Sdg Number: JP0481

Method: 9056M Method Blank - Batch: 280-162031 Preparation: N/A

Lab Sample ID:

Client: Washington Closure Hanford

MB 280-161901/2-A

Analysis Batch: Prep Batch:

280-162031 N/A

Lab File ID:

Instrument ID:

WC\_IC3 131.TXT

DI

Client Matrix: Dilution:

Solid 1.0 02/25/2013 1624

Leach Batch: Units:

280-161901 mg/Kg

Initial Weight/Volume: Final Weight/Volume:

MOI

Analysis Date: Prep Date:

N/A

Leach Date:

02/25/2013 1045

Analyte	Result	Qual	MUL	NL .
Chloride-Soluble	2.0	บ	2.0	5.0
Bromide-Soluble	0.38	บ	0.38	2.0
Sulfate-Soluble	1.7	บ	1.7	5.0
Fluoride-Soluble	0.81	บ	0.81	5.0

Method Reporting Limit Check - Batch: 280-162031

Method: 9056M Preparation: N/A

Lab Sample ID: Client Matrix:

Solid

MRL 280-162031/3

Analysis Batch: Prep Batch:

280-162031 N/A

Instrument ID:

WC IC3 112.TXT

Dilution: Analysis Date:

1.0

02/25/2013 1048

Leach Batch: Units:

N/A mg/L Lab File ID: Initial Weight/Volume:

Final Weight/Volume:

5 mL

N/A Prep Date: Leach Date: N/A

Analyte	Spike Amount	Result	% Rec.	Limit	Quai
	1.00	1.21	121	50 - 150	В
Chloride-Soluble	0.200	0.116	58	50 - 150	В
Bromide-Soluble		1.16	116	50 - 150	В
Sulfate-Soluble	1.00	0.229	115	50 - 150	В
Fluoride-Soluble	0.200	0.229	113	00 - 100	_

Lab Control Sample - Batch: 280-162031

Method: 9056M Preparation: N/A

Lab Sample ID: Client Matrix:

Solid 1.0

LCS 280-161901/1-A

Analysis Batch: Prep Batch: Leach Batch:

Units:

280-162031 N/A 280-161901

mg/Kg

Instrument ID: Lab File ID:

WC\_IC3 130.TXT

Qual

Dilution: Analysis Date:

02/25/2013 1608

Initial Weight/Volume: Final Weight/Volume:

Prep Date: Leach Date:

02/25/2013 1045

Analyte	Spike Amount	Result	% Rec.	Limit
Chloride-Soluble	250	233.9	94	90 - 110
Bromide-Soluble	50.0	48.93	98	90 - 110
Sulfate-Soluble	250	239.2	96	90 - 110
Fluoride-Soluble	50.0	48.80	98	90 - 110

TestAmerica Denver

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Client: Washington Closure Hanford

Job Number: 280-39178-1

Sdg Number: JP0481

Matrix Spike - Batch: 280-162031

Method: 9056M Preparation: N/A

Lab Sample ID:

280-39178-2

Analysis Batch: Prep Batch:

280-162031

Instrument ID:

WC\_IC3

Client Matrix: Dilution:

Solid 1.0

Leach Batch:

N/A 280-161901 Lab File ID:

134.TXT

Analysis Date:

02/25/2013 1714

Units:

mg/Kg

Initial Weight/Volume:

Final Weight/Volume:

Prep Date:

N/A

Leach Date:

02/25/2013 1045

Analyte	Sample Resul	t/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Chloride-Soluble	4.9	В	255	255.6	98	80 - 120	
Bromide-Soluble	0.40	U	51.0	51.97	102	80 - 120	
Sulfate-Soluble	4.1	В	255	274.7	106	80 - 120	
Fluoride-Soluble	1.2	В	51.0	48.83	93	80 - 120	

Duplicate - Batch: 280-162031

Method: 9056M Preparation: N/A

Lab Sample ID: Client Matrix:

280-39178-2

Solid 1.0

02/25/2013 1657

Analysis Date: Prep Date: Leach Date:

Dilution:

N/A

02/25/2013 1045

Analysis Batch: 280-162031

Prep Batch: Leach Batch: Units:

N/A 280-161901 mg/Kg

Instrument ID:

Lab File ID:

WC\_IC3 133.TXT

Initial Weight/Volume: Final Weight/Volume:

Analyte	Sample Re	Sample Result/Qual R		RPD	Limit	Qual
Chloride-Soluble	4.9	В	5.07	4	15	В
Bromide-Soluble	0.40	U	0.40	NC	15	U
Sulfate-Soluble	4.1	В	4.06	0.6	15	В
Fluoride-Soluble	1.2	В	1.26	4	15	В

WC\_IC3

131.TXT

Job Number: 280-39178-1 Client: Washington Closure Hanford Sdg Number: JP0481

280-162032

280-161901

N/A

mg/Kg

Method Blank - Batch: 280-162032 Method: 9056M

Prep Batch:

Leach Batch:

Units:

Analysis Batch:

Lab Sample ID: MB 280-161901/2-A Client Matrix: Solid

Dilution: 1.0

Analysis Date: Prep Date:

Leach Date:

02/25/2013 1624

N/A

02/25/2013 1045

Preparation: N/A

Instrument ID:

Lab File ID:

Initial Weight/Volume:

Final Weight/Volume:

Qual MDL RL Result Analyte 2.5 0.31 Nitrate as N-Soluble 0.31 U 2.5 0.33 U 0.33 Nitrite as N-Soluble U 1.2 5.0 Orthophosphate as P-Soluble 1.2

Method: 9056M Method Reporting Limit Check - Batch: 280-162032

Units:

Preparation: N/A

Lab Sample ID: Client Matrix:

Analysis Date:

Dilution:

MRL 280-162032/3 Solid 1.0

02/25/2013 1048

Analysis Batch: Prep Batch: Leach Batch:

280-162032 N/A N/A mg/L

Instrument ID: Lab File ID:

WC\_IC3 112.TXT

WC\_IC3

130.TXT

Qual

Initial Weight/Volume: Final Weight/Volume: 5 mL

N/A Prep Date: N/A Leach Date:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N-Soluble	0.200	0.243	122	50 - 150	В
Nitrite as N-Soluble	0.200	0.230	115	50 - 150	B
Orthophosphate as P-Soluble	0.200	0.19	87	50 - 150	υ

Method: 9056M Lab Control Sample - Batch: 280-162032 Preparation: N/A

Units:

Lab Sample ID: Client Matrix: Dilution:

Analysis Date:

LCS 280-161901/1-A Solid 1.0

02/25/2013 1608 N/A

Analysis Batch: Prep Batch: Leach Batch:

280-162032 N/A 280-161901 mg/Kg

Instrument ID:

Lab File ID: Initial Weight/Volume: Final Weight/Volume:

Prep Date: 02/25/2013 1045 Leach Date:

Analyte	Spike Amount	Result	% Rec.	Limit
Nitrate as N-Soluble	50.0	49.46	99	90 - 110
Nitrite as N-Soluble	50.0	48.63	97	90 - 110
Orthophosphate as P-Soluble	50.0	48.44	97	90 - 110

**TestAmerica Denver** 

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Job Number: 280-39178-1

Sdg Number: JP0481

Matrix Spike - Batch: 280-162032

Client: Washington Closure Hanford

Method: 9056M Preparation: N/A

Lab Sample ID: Client Matrix:

280-39178-2 Solid

1.0

Dilution: 02/25/2013 1714 Analysis Date:

Prep Date:

N/A

02/25/2013 1045 Leach Date:

Analysis Batch:

Units:

Leach Batch:

Prep Batch:

280-162032

N/A 280-161901 mg/Kg

Instrument ID:

Lab File ID:

WC\_IC3 134.TXT

Initial Weight/Volume:

Final Weight/Volume:

Analyte	Sample Resul	/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N-Soluble	0.32	U	51.0	54.62	107	80 - 120	
Nitrite as N-Soluble	0.34	U	51.0	51.99	102	80 - 120	
Orthophosphate as P-Soluble	2.4	В	51.0	65.30	123	80 - 120	N

Duplicate - Batch: 280-162032

Method: 9056M Preparation: N/A

Lab Sample ID: Client Matrix:

Analysis Date:

Dilution:

Solid

280-39178-2

1.0 02/25/2013 1657

N/A

Prep Date: 02/25/2013 1045 Leach Date:

280-162032 Analysis Batch:

Prep Batch: N/A 280-161901 Leach Batch: Units:

mg/Kg

Instrument ID:

Lab File ID:

WC\_IC3 133.TXT

Initial Weight/Volume: Final Weight/Volume:

RPD Limit Qual Result Sample Result/Qual Analyte U 15 NC 0.32 U 0.32 Nitrate as N-Soluble U NC 15 0.34 U 0.35 Nitrite as N-Soluble 9 15 В 2.15 Orthophosphate as P-Soluble 2.4 В

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Date:

15 April 2013

To:

Washington Closure Hanford Inc. (technical representative)

From:

**ELR Consulting** 

Project:

100-IU-2 & 100-IU-6 Remaining Waste Sites - Soil Full Protocol - Waste Site

600-303

Subject:

Inorganics - Data Package No. JP0481-TAL

### INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0481 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1RFN3	2/20/13	Soil	C	See note 1
J1RFN4	2/20/13	Soil	С	See note 1
J1RFN2	2/20/13	Soil	C	See note 1

<sup>1 -</sup> ICP metals (6010B) and mercury by 7471A.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

Appendix 6. Additional Documentation Requested by Client

# DATA QUALITY PARAMETERS

## Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 6 months for ICP metals and 28 days for mercury.

All holding times were acceptable.

### Preparation (Method) Blanks

### **Preparation Blanks**

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "UJ". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

Due to method blank contamination, all cadmium results were qualified as undetected and flagged "UJ".

All other preparation blank results were acceptable.

### Field (Equipment) Blank

One field blank (J1RFN2) was submitted for analysis. Fourteen analytes were detected in the field blank. Under the WCH statement of work, no qualification is required.

#### Accuracy

### Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to matrix spike recoveries outside QC limits, all aluminum (403%), manganese (69%) and silicon (20%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (7%), all silicon results were qualified as estimates and flagged "J".

All other accuracy results were acceptable

#### Precision

### Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPD outside QC limits, all iron (138%) results were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

### Field Duplicate

One set of field duplicates (J1RFN3/J1RFN4) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

## Analytical Detection Levels

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

#### Completeness

Data package No. JP0481 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

### **MAJOR DEFICIENCIES**

None found.

### MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, all cadmium results were qualified as undetected and flagged "UJ".
- Due to matrix spike recoveries outside QC limits, all aluminum (403%), manganese (69%) and silicon (20%) results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (7%), all silicon results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits, all iron (138%) results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

### **REFERENCES**

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, September 2009.

# Appendix 1 Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

# INORGANICS DATA QUALIFICATION SUMMARY\*

SDG: JP0481	REVIEWER: ELR	Project: 600-303	PAGE 1_OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Cadmium	UJ	All	Method blank contamination
Aluminum Manganese Silicon	J	All	MS recovery
Silicon	J	All	LCS recovery
Iron	J	All	RPD

<sup>\* -</sup> The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

# Appendix 3 Annotated Laboratory Reports

### **Analytical Data**

Job Number: 280-39178-1 Client: Washington Closure Hanford

Sdg Number: JP0481

Client Sample ID:

J1RFN2

Lab Sample ID:

280-39178-1

Client Matrix:

Solid

% Moisture:

0.0

Date Sampled: 02/20/2013 1055

Date Received: 02/22/2013 1000

6010B	Metals	(ICP)
-------	--------	-------

Analysis Method: Prep Method:

6010B 3050B

1.0

Analysis Date: Prep Date:

Dilution:

02/26/2013 0106 02/25/2013 1345 Analysis Batch: Prep Batch:

280-162040 280-161812

-4/14/13

Instrument ID: Lab File ID:

MT 026 26A5022513.asc

Initial Weight/Volume: Final Weight/Volume:

1.07 g 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		198	XN	1.4	4.7
Arsenic		0.62	U	0.62	0.93
Barium		2.0		0.071	0.47
Beryllium		0.047	В	0.031	0.19
Boron		0.92	U	0.92	1.9
Cadmium		0.039	BC UJ	0.038	0.19
Calcium		33.5	В	13.2	46.7
Chromium		0.084	В	0.054	0.19
Cobalt		0.13	В	0.093	0.93
Copper		0.20	U	0.20	0.93
Lead		0.83	M ′	0.25	0.47
Magnesium		21.8	_	3.5	18.7
Manganese		14.6	Ти	0.093	0.93
Molybdenum		0.24	U	0.24	1.9
Nickel		0.11	U	0.11	3.7
Potassium		64.9	В	38.3	280
Silver		0.15	U	0.15	0.19
Vanadium		0.53	вм	0.088	1.9
Zinc		1.9	М	0.37	0.93

Analysis Method: Prep Method:

Dilution:

3050B

6010B 1.0 02/26/2013 1938

Analysis Date: 02/25/2013 1345 Prep Date:

Analysis Batch: Prep Batch:

280-162255 280-161812

Instrument ID: Lab File ID:

Initial Weight/Volume:

Final Weight/Volume:

MT\_026 26A3022613.asc

1.07 g 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL	
Antimony		0.36	U	0.36	0.56	
Iron		1350	МΔ	3.6	4.7	
Selenium		0.80	U	0.80	0.93	
Silicon		89.3	N T	5.3	9.3	
Sodium		55.1	U	55.1	112	

#### 7471A Mercury (CVAA)

Analysis Method: Prep Method: Dilution:

7471A 7471A 1.0

02/23/2013 1541

Analysis Batch: Prep Batch:

280-161906 280-161750 Instrument ID: Lab File ID:

MT 033 130223ab.txt

Initial Weight/Volume: Final Weight/Volume:

MDL

0.0057

.58 g 50 mL

Analysis Date: Prep Date: 02/23/2013 1230

Analyte DryWt Corrected: Y Mercury

Result (mg/Kg) 0.0057

Qualifier

RL 0.018

**TestAmerica Denver** 

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### **Analytical Data**

Job Number: 280-39178-1 Client: Washington Closure Hanford

Sdg Number: JP0481

Client Sample ID:

J1RFN3

Lab Sample ID:

280-39178-2

Client Matrix:

Solid

% Moisture:

3.9

Date Sampled: 02/20/2013 1107

Date Received: 02/22/2013 1000

6010B Metals (ICP)

Analysis Method: Prep Method:

6010B 3050B Analysis Batch: Prep Batch:

280-162040 280-161812

Instrument ID: Lab File ID:

MT\_026 26A5022513.asc

Dilution: Analysis Date: 1.0

02/26/2013 0116

Initial Weight/Volume: Final Weight/Volume:

1.00 g 100 mL

Prep Date:

02/25/2013 1345

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7280	× J	1.6	5.2
Arsenic		2.7	•	0.69	1.0
Barium		67.8		0.079	0.52
Beryllium		0.23		0.034	0.21
Boron		1.7	В	1.0	2.1
Cadmium		0.099	BC UJ	0.043	0.21
Calcium		3480	• • •	14.7	52.0
Chromium		10.8		0.060	0.21
Cobalt		6.2		0.10	1.0
Copper		11.8		0.23	1.0
Lead		8.8		0.28	0.52
Magnesium		4270		3.9	20.8
Vianganese		286	<b>*</b> ***********************************	0.10	1.0
Molybdenum		0.36	В	0.27	2.1
Nickel		9.7		0.13	4.2
Potassium		1480		42.7	312
Silver		0.17	U	0.17	0.21
Vanadium		39.6		0.098	2.1
Zinc		47.8		0.41	1.0

Analysis Method: Prep Method:

Analysis Date:

Prep Date:

Dilution:

6010B 3050B 1.0

02/26/2013 1948

02/25/2013 1345

Prep Batch:

Analysis Batch:

280-162255 280-161812 Instrument ID: Lab File ID:

MT\_026 26A3022613.asc

Initial Weight/Volume: Final Weight/Volume:

1.00 g 100 mL

Analyte (	DryWt Corrected: Y	Result (mg/Kg)	Qualifler	MDL	RL
Antimony		0.49	В	0.40	0.62
Iron		17100	I	4.0	5.2
Selenium		0.89	Ū	0.89	1.0
Silicon		169	NJ	5.9	10.4
Sodium		199	_	61.4	125

7471A Mercury (CVAA)

Analysis Method: Prep Method:

7471A 7471A 1.0

Analysis Batch: Prep Batch:

280-161906 280-161750

Instrument ID: Lab File ID:

Initial Weight/Volume:

Final Weight/Volume:

MT\_033 130223ab.txt .57 g

Dilution: Analysis Date: 02/23/2013 1544

Prep Date: 02/23/2013 1230

DryWt Corrected: Y

Result (mg/Kg)

50 mL

Analyte Qualifier MDL RL 0.0061 0.019 Mercury 0.0061 U

**TestAmerica Denver** 

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### **Analytical Data**

Job Number: 280-39178-1

Sdg Number: JP0481

Client Sample ID:

J1RFN4

Client: Washington Closure Hanford

Lab Sample ID:

280-39178-3

Client Matrix:

Solid

% Moisture:

3.5

Date Sampled: 02/20/2013 1107

Date Received: 02/22/2013 1000

#### 6010B Metals (ICP)

Analysis Method: Prep Method:

Analysis Date: Prep Date:

Dilution:

6010B 3050B 4 0

Analysis Batch: Prep Batch:

280-162040 280-161812

Lab File ID:

Instrument ID:

MT\_026 26A5022513.asc

Initial Weight/Volume: Final Weight/Volume:

1.17 g 100 mL

02/26/2013 0118	ryhali
02/25/2013 1345	141190

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7080	×J	1.4	4.4
Arsenic		2.3		0.58	0.89
Barium		66.9		0.067	0.44
Beryllium		0.23		0.029	0.18
Boron		1.5	В	0.87	1.8
Cadmium		0.095	BCUI	0.036	0.18
Calcium		3320		12.5	44.3
Chromium		10.6		0.051	0.18
Cobalt		6.2		0.089	0.89
		12.3		0.19	0.89
Copper Lead		16.2		0.24	0.44
		4150		3.3	17.7
Magnesium		273	イ	0.089	0.89
Manganese		0.23	<b>ن</b> ر	0.23	1.8
Molybdenum		9.7	•	0.11	3.5
Nickel		1460		36.3	266
Potassium		0.14	U	0.14	0.18
Silver		38.8	•	0.083	1.8
Vanadium		52.8		0.35	0.89
Zinc		52.0		0.00	5.55

Analysis Method:
Prep Method:

Analysis Date:

Prep Date:

Dilution:

6010B 3050B 1.0

02/26/2013 1950

02/25/2013 1345

Analysis Batch: Prep Batch:

280-162255 280-161812 instrument ID: Lab File ID:

Final Weight/Volume:

Initial Weight/Volume:

MT\_026 26A3022613.asc

1.17 g 100 mL

Analyte DryWt Corrected: Y Result (mg/Kg) Qualifier MDL	RL
Antimony 0.43 B 0.34	0.53
Iron 16600 3.4	4.4
Selenium 0.76 U 0.76	0.89
Silicon 124 N <b>T</b> 5.0	8.9
Sodium 182 52.3	106

#### 7471A Mercury (CVAA)

Analysis Method: Prep Method:

7471A 7471A 1.0

Analysis Batch: Prep Batch:

280-161906 280-161750 Instrument ID: Lab File ID:

MT\_033 130223ab.bt

Initial Weight/Volume: Final Weight/Volume:

MDL

0.0063

.55 g 50 mL

Analysis Date: Prep Date:

Dilution:

02/23/2013 1555 02/23/2013 1230

DryWt Corrected: Y Analyte Mercury

Result (mg/Kg) 0.0063

Qualifier

RL 0.019

**TestAmerica Denver** 

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# Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

#### CASE NARRATIVE

Client: Washington Closure Hanford

**Project: WASHINGTON CLOSURE HANFORD** 

Report Number: 280-39178-1

SDG #: JP0481 SAF#: RC-232

Date SDG Closed: February 22, 2013 Data Deliverable: 7 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1RFN2	280-39178-1	6010/7471	6010B/7471A
J1RFN3	280-39178-2	6010/7471/9056M/353.2/8310	6010B/7471A/9056M/353.2/8310
J1RFN4	280-39178-3	6010/7471/9056M/353.2/8310	6010B/7471A/9056M/353.2/8310

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

#### RECEIPT

The samples were received on 2/22/2013 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.9° C.

#### HPLC - SW846 8310 - PAHs

No anomalies were encountered.

#### TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-161812 indicates that physical and chemical interferences are present for Aluminum. Results have been flagged with an "X".

Low levels of Cadmium are present in the method blank associated with batch 280-161812. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-161812, and the associated sample results have been flagged "N". Silicon is a poor performer and has a history of reacting inconsistently. Data are reported as is.

It can be noted that the sample amount was greater than four times the spike amount for Iron in the Matrix Spike performed on sample J1RFN2; therefore, control limits are not applicable.

Aluminum was recovered outside the control limits in the Matrix Spike performed on sample J1RFN2, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

The duplicate analysis of sample J1RFN2 exhibited RPD data outside the control limits for Lead, Manganese, Vanadium, Zinc and Iron, and the associated sample results have been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

Antimony is present at a level greater than the reporting limit in the instrument blank associated with analysis batch 280-162255. As Antimony is not present at a level greater than the reporting limit in the associated samples, corrective action is deemed unnecessary.

No other anomalies were encountered.

### GENERAL CHEMISTRY - MCAWW 353.2 - NITRATE NITRITE as N

The Matrix Spike performed on sample J1RFN4 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

The duplicate analysis of sample J1RFN4 exceeded the RPD limit, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

#### **GENERAL CHEMISTRY - SW846 9056M - ANIONS**

The Orthophosphate as P Matrix Spike performed on sample J1RFN3 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

Jollector Brackett, R roject Designation									200
roject Designation		Company Contact Joan Kesmer	Contact	Telephone No. 509-375-4688	No. 14688		Project Coordinator KESSNER, JH	Price Code 48C-8B Data Turnarround	Page 1
100-IU-2 & 100-IU-6 Rema	oject Destenation 100-IU-2 & 100-IU-6 Remaining Waste Sites - Soil Full Prot	Sampling Location Prot 600-303	ocation				SAF No. RC-232		Cilmin #1
CHOKING WCH-	WCH-12 -0176	2	ook No.		COA 0603032000		Method of Shiperent	Fed 25X	
Shipped To TestAmerica Incomorated	ulpped To Set the Of NUER	Offsite Property No.		A 120764	66		Bill of Lading/Air Bill No.	MING See OSPC	
POSSIBLE SAMPLE HAZAEDS/REMARKS May. contain hazadous nibstances at levels that	POSSTBLE SAMPLE BAZARDS/REMARKS May.contain hazardous nibstances at levels that present risk to	iskto	Preservation	20 7.	Cod 4C	Cool 4C			
humans and/or the environment			Type of Container	90	\$	å			
Special Handling and/or Storage Materia recompilion as indicated in header.	Storage	ž	No. of Container(s)	-	-	1			
			Volume	125mL	_	125mJ,			
	SAMPLE ANALYSIS	2		See Free (1) in Special Instructions.	See item (3) in Special Instructions.	PAH-4110			
Sample No.	Matrix •	Sample Date	Sample Time					· · · · · · · · · · · · · · · · · · ·	
JIRFN2	SOIL	2/20/13	5501	×			2 m/2		
J1RFN3	SOIL	2/20113	₹011.	×	×	×			1
JIREN4	SOIL	2/20/13	1107	×	×	×			1
							1		1
CHAIN OF POSSESSION	NO	Sign/Print Names	mes		SPEC	SPECIAL INSTRUCTIONS	CITIONS		Matrix
elinquished By Removed Fram	Davine HUS		nds -da	0/13 (145	(3) XC	P Motals - 60101	TR (Close-out List) {Abunitum monium Cobait Conner, NOD.	(1) ICP Monis - 60101R (Close-out List) (Abuniaum, Antimony, Ausenie, Barium, Beryllium, Borrot. Codminn, Calvian Chroniam, Cobalt. Conoct. Ivon, Lista, Magnesium, Mangmesto, Modyledonon,	
4 4 7	Date/Time	THE WAY	Manghoun 3	133C	N A	Potentium, Science)	mien, Silicen, Silver, Sodism,	Nickel, Potentium, Schrittun, Silven, Staten, Sodium, Vansdium, Zinc); Marcary - 1471 - (CV) (Marcary - 1471 - (CV) 100 - 100 - 1005, McAffed Boronick Charitte, Flactick, Marcary in Vierne, Nitrogen in Nitria.	
	18 0	Received By/Stored I	Fed Ex.	Date/Time	TA SE	Phosphorous in phospin 9045 (pd. Monarcusta	hospitate, Suifite); NOZ/NO3 - 353.2	(Nikogra in Mirite and Nikrate); pH-(Soul) -	10.00
telinguished Jay/Removed From	Date	MOR	72	732	1000			SEMEMED	
Relinquished By/Removed From	DetroTime	Received By/Stafed I	)	Mate/Time		JOI.	IP0481	TAN TO THE PARTY OF THE PARTY O	
Reinquished By/Removed From	Deta/Time	Received By/Stored In		Dette/Time	$\dashv$	5	[ ]	SATE	
LABORATORY Received By SECTION	-By			Title				2-12-2	
FINAL SAMPLE Disposal Method	Method	Pi.				Dapoged by	d by		

# Appendix 5

Data Validation Supporting Documentation

<u>V</u> ALIDATION LEVEL:	Α	В	(c)	D	Е
PROJECT:	600-30	3	DATA PACKAG	E: JPO	401
VALIDATOR:	ELR	LAB: TAC		DATE: 4//	4/13
			SDG: JP	0481	
		ANALYSES	PERFORMED		
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MAT	RIX	.1	<u> </u>		
		TIRFU3	TIRF	-WY	
JIM	$\mathcal{U}$	10.12	5 11 4	<del></del>	
					4 4
	ACKAGE COMP				Ye (No) N/.
Technical verifica		present?			
Comments:	tion documentation	present?	LIBRATIONS (Le	evels D and E)	Ye (No) N/.
Comments:  INSTRU  Initial calibrations	UMENT PERFOR	mance and cal	LIBRATIONS (Le	vels D and E)	Ye No N/.
Comments:  Initial calibrations  Initial calibrations	JMENT PERFORIST PERFORIST SET OF A SECONDAL PERFORMENT AS ACCEPTABLE?	MANCE AND CA	LIBRATIONS (Le	vels D and E)	Yet No N/.
Comments:  Initial calibrations  Initial calibrations	JMENT PERFORIST PERFORIST SET OF A SECONDAL PERFORMENT AS ACCEPTABLE?	MANCE AND CA	LIBRATIONS (Le	vels D and E)	Yet No N/.
Comments:  INSTRU  Initial calibrations ICP interference of	DMENT PERFORING performed on all inchecks acceptable?	MANCE AND CA	LIBRATIONS (Le	vels D and E)	Yes No N/Yes No N/
2. INSTRU Initial calibrations ICP interference of ICV and CCV chellow	JMENT PERFORING performed on all inchecks acceptable?	MANCE AND CA	LIBRATIONS (Le	vels D and E)	Yes No N/Yes No N/
2. INSTRU Initial calibrations ICP interference of ICV and CCV che ICV and CCV che Standards traceab	DMENT PERFORISTS performed on all inchecks acceptable?	MANCE AND CA	LIBRATIONS (Le	vels D and E)	Yes No N/
2. INSTRU Initial calibrations ICP interference of ICV and CCV che Standards traceab	JMENT PERFORISTS performed on all inchecks acceptable?	MANCE AND CAnstruments?	LIBRATIONS (Le	vels D and E)	Yes No N/
2. INSTRU Initial calibrations ICP interference of ICV and CCV che Standards traceab	DMENT PERFORISTS performed on all inchecks acceptable?	MANCE AND CAnstruments?	LIBRATIONS (Le	vels D and E)	Yes No N/

BLANKS (Levels B, C, D, and E)	
CB and CCB checks performed for all applicable analyses? (Levels D, E)	
CB and CCB results acceptable? (Levels D, E)	Yes No(N/A)
_aboratory blanks analyzed?	Yes No N/A
_aboratory blank results acceptable?	Yes No N/A
Field blanks analyzed? (Levels C, D, E)	Yes No N/A
Field blank results acceptable? (Levels C, D, E)	Ye No (NA 4)
Transcription/calculation errors? (Levels D, E)	Yes No N/A
Comments: Calmium - UJ - alf	
FD- 14 detect	
	= 13
4. ACCURACY (Levels C, D, and E)	$\rightarrow$
MS/MSD samples analyzed?	- / '\
MS/MSD results acceptable?	<b>U</b> " \
MS/MSD standards NIST traceable? (Levels D, E)	
MS/MSD standards expired? (Levels D, E)	
LCS/BSS samples analyzed?	(Yes) No N/A
LCS/BSS results acceptable?	Yes No MA
Standards traceable? (Levels D, E)	Yes No (1754)
Standards expired? (Levels D, E)	Yes No 144
Transcription/calculation errors? (Levels D, E)	Yes No NW
Performance audit sample(s) analyzed?	Yes (Nd) N/A
Performance audit sample results acceptable?	Yes No (N/)
Comments: Lc3 - Silica 700 - J coop	
MG - Wangarer (699.) SI/10 (202)	-J ell
al 403% - Jay	
· ·	

5. PRECISION (Levels C, D, and E)		<b>\</b>
Duplicate RPD values acceptable?	No.	JN/A
Duplicate results acceptable?Yes	40	N/A
MS/MSD standards NIST traceable? (Levels D, E)Yes	No (	级
MS/MSD standards expired? (Levels D, E)	No	W/A)
Field duplicate RPD values acceptable?Yes	No	N/A
Field split RPD values acceptable?Yes	No (	N/A
Transcription/calculation errors? (Levels D, E)	No	Ø/A
Comments: 1ran - 387 5 all		
6. ICP QUALITY CONTROL (Levels D and E)		$\bigcap$
ICP serial dilution samples analyzed?	No	N/A
ICP serial dilution %D values acceptable?	No	N/A
ICP post digestion spike required?	No	N/A
ICP post digestion spike values acceptable?Yes	No	N/A
Standards traceable?	No	N/A
Standards expired?Yes	No	N/A
Transcription/calculation errors?	No	N/A
Comments:		$\underline{\hspace{0.1cm}}$

7.	FURNACE AA QUALITY CONTROL (Levels D and E)		(	
Dupli	icate injections performed as required?	Yes No	0/1	N/A
	licate injection %RSD values acceptable?			
	ytical spikes performed as required?			
	ytical spike recoveries acceptable?			
	dards traceable?			
	dards expired?			
MSA	A performed as required?	Yes N	0	N/A
MSA	A results acceptable?	Yes N	o	N/A
Trans	scription/calculation errors?	Yes N	6	N/A
	nments:		_	_
				<del>-,</del>
8.	HOLDING TIMES (all levels)	$\mathcal{C}$		
Samp	ples properly preserved?		lo	N/A
Samp	ple holding times acceptable?	Yes N	lo	N/A
Com	nments:			
·········				

9.	RESULT QUANTITATION AND DETECTION LIMITS (all levels)	
Results	reported for all requested analyses?	Yes No N/A
Results	supported in the raw data? (Levels D. E)	
Samples	properly prepared? (Levels D, E)	
Detection	n limits meet RDL?	
Transcr	properly prepared? (Levels D, E)	Yes No N/A
	nts:	
		······································

# Appendix 6 Additional Documentation Requested by Client

Job Number: 280-39178-1

Sdg Number: JP0481

Method Blank - Batch: 280-161812

Client: Washington Closure Hanford

Method: 6010B Preparation: 3050B

Lab Sample ID:

MB 280-161812/1-A

Analysis Batch:

Units:

280-162040 280-161812 Instrument ID: Lab File ID:

MT\_026

Client Matrix: Dilution:

Solid 1.0

Prep Batch: Leach Batch:

N/A

Initial Weight/Volume:

26A5022513.asc

Analysis Date: Prep Date:

02/26/2013 0101 02/25/2013 1345

mg/Kg

Final Weight/Volume:

1 g 100 mL

Leach Date:

N/A

Analyte	Result	Qual	MDL	RL
	1.6	U	1.6	5.0
Aluminum	0.66	U	0.66	1.0
Arsenic	0.076	Ū	0.076	0.50
Barium	0.033	Ü	0.033	0.20
Beryllium		Ü	0.98	2.0
Boron	0.98		0.041	0.20
Cadmium	0.0510	В	14.1	50.0
Calcium	14.1	U		0.20
Chromium	0.058	U	0.058	
Cobalt	0.10	U	0.10	1.0
Copper	0.22	U	0.22	1.0
Lead	0.27	U	0.27	0.50
Magnesium	3.7	U	3.7	20.0
<del>-</del>	0.10	U	0.10	1.0
Manganese	0.26	U	0.26	2.0
Molybdenum	0.12	U	0.12	4.0
Nickel	41.0	Ū	41.0	300
Potassium	0.16	ŭ	0.16	0.20
Silver		Ü	0.094	2.0
Vanadium	0.094	_	0.40	1.0
Zinc	0.40	U	0.40	1.0

Method Blank - Batch: 280-161812

Method: 6010B Preparation: 3050B

Lab Sample ID: Client Matrix:

Solid 1.0

MB 280-161812/1-A

Analysis Batch: Prep Batch: Leach Batch:

Units:

280-162255 280-161812 N/A

mg/Kg

Instrument ID: Lab File ID: Initial Weight/Volume:

Final Weight/Volume:

MT\_026 26A3022613.asc 1 g

100 mL

Analysis Date: Prep Date: Leach Date:

Dilution:

02/26/2013 1933 02/25/2013 1345

NΑ

Analyte	Result	Qual	MDL	RL
Anthropy	0.38	U	0.38	0.60
Antimony	3.8	U	3.8	5.0
Iron	0.86	U	0.86	1.0
Selenium	5.7	Ü	5.7	10.0
Silicon	59.0	Ü	59.0	120
Sodium	39.0	_		

TestAmerica Denver

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Job Number: 280-39178-1

Sdg Number: JP0481

Lab Control Sample - Batch: 280-161812

Client: Washington Closure Hanford

Method: 6010B Preparation: 3050B

Lab Sample ID: Client Matrix:

Solid

LCS 280-161812/2-A

Analysis Batch: Prep Batch: Leach Batch:

280-162040 280-161812 N/A

Instrument ID: Lab File ID:

MT\_026 26A5022513.asc

Dilution: Analysis Date:

1.0 02/26/2013 0104 Units: mg/Kg Initial Weight/Volume: Final Weight/Volume: 1 g 100 mL

Prep Date:

02/25/2013 1345

Leach Date:

N/A

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	189.5	95	82 - 116	
Arsenic	100	101.8	102	85 - 110	
Barium	200	191.3	96	87 - 112	
Beryllium	5.00	4.88	98	84 - 114	
Boron	100	96.89	97	81 - 110	
Cadmium	10.0	9.70	97	87 - 110	
Calcium	5000	4557	91	82 - 114	
Chromium	20.0	19.71	99	84 - 114	
Cobalt	50.0	47.16	94	87 - 110	
Copper	25.0	25.88	104	88 - 110	
Lead	50.0	47.03	94	86 - 110	
Magnesium	5000	4878	98	90 - 110	
Manganese	50.0	45.99	92	88 - 110	
Molybdenum	100	98.33	98	86 - 110	
Nickel	50.0	45.34	91	87 - 110	
Potassium	5000	4820	96	89 - 110	
Silver	5.00	4.88	98	87 - 114	
Vanadium	50.0	49.27	99	88 - 110	
Zinc	50.0	44.95	90	76 - 114	

Lab Control Sample - Batch: 280-161812

Method: 6010B Preparation: 3050B

Lab Sample ID: Client Matrix:

Solid

LCS 280-161812/2-A

Analysis Batch: Prep Batch: Leach Batch:

Units:

280-162255 280-161812 Instrument ID: Lab File ID:

MT\_026 26A3022613.asc

Analysis Date: Prep Date:

Dilution:

02/26/2013 1936 02/25/2013 1345

N/A mg/Kg Initial Weight/Volume: Final Weight/Volume:

1 g 100 mL

Leach Date:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Antimony	50.0	51.49	103	82 - 110	
Iron	100	96.97	97	87 - 120	
Selenium	200	196.0	98	83 - 110	
Silicon	1000	73.46	7	10 - 70	N
Sodium	5000	5501	110	90 - 112	

**TestAmerica Denver** 

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Job Number: 280-39178-1 Sdg Number: JP0481

Method: 6010B Matrix Spike - Batch: 280-161812 Preparation: 3050B

Lab Sample ID: 280-39178-1 Client Matrix: Dilution:

Solid 1.0 Analysis Date:

Client: Washington Closure Hanford

Prep Date:

02/26/2013 0113 02/25/2013 1345

Leach Date: N/A Analysis Batch: 280-162040 Instrument ID:

Prep Batch: Leach Batch: N/A Units:

280-161812 mg/Kg

Lab File ID:

Initial Weight/Volume: Final Weight/Volume: MT\_026 26A5022513.asc

1.10 g 100 mL

AnalyteAluminum	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
	198	_ ·_ ·	182	930.5	403	50 - 200	N
Arsenic	0.62	U	90.9	89.08	98	76 - 111	
Barium	2.0		182	168.0	91	52 - 159	
Beryllium	0.047	В	4.55	4.22	92	72 - 105	
Boron	0.92	U	90.9	85.34	94	75 - 107	
Cadmium	0.039	В	9.09	8.41	92	40 - 130	
Calcium	33.5	В	4550	3963	86	43 - 165	
Chromium	0.084	В	18.2	17.28	95	70 - 200	
Cobalt	0.13	В	45.5	41.15	90	72 - 106	
Copper	0.20	U	22.7	23.13	102	37 - 187	
Lead	0.83		45.5	41.65	90	70 - 200	
Magnesium	21.8		4550	4373	96	64 - 145	
Manganese	14.6		45.5	45.72	69	40 - 200	
Molybdenum	0.24	U	90.9	85.56	94	75 - 103	
Nickel	0.11	U	45.5	39.55	87	61 - 126	
Potassium	64.9	В	4550	4235	92	56 - 172	
Silver	0.15	U	4.55	4.31	95	75 - 141	
Vanadium	0.53	В	45.5	44.03	96	50 - 169	
Zinc	1.9		45.5	41.31	87	70 - 200	

Matrix Spike - Batch: 280-161812

Method: 6010B Preparation: 3050B

Lab Sample ID: Client Matrix: Dilution: Analysis Date:

Prep Date: Leach Date: 280-39178-1 Solid 1.0

N/A

02/26/2013 1946 02/25/2013 1345 Analysis Batch: Prep Batch: Leach Batch:

Units:

280-162255 280-161812 N/A mg/Kg

Instrument ID: Lab File ID:

MT\_026 26A3022613.asc

Initial Weight/Volume: 1.10 g 100 mL Final Weight/Volume:

Analyte	Sample Result/	Qual	Spike Amount	Result	% Rec.	Limit	Qual
Antimony	0.36	U	45.5	43.22	95	20 - 200	
Iron	1350		90.9	398.3	-1042	70 - 200	4
Selenium	0.80	U	182	168.1	92	76 - 104	
Silicon	89.3		909	267.1	20	20 - 200	
Sodium	55.1	U	4550	4703	103	78 - 111	

**TestAmerica Denver** 

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Job Number: 280-39178-1

Sdg Number: JP0481

Duplicate - Batch: 280-161812

Method: 6010B Preparation: 3050B

Lab Sample ID: Client Matrix:

Client: Washington Closure Hanford

280-39178-1 Solid

Analysis Batch: Prep Batch:

280-162040 280-161812

Lab File ID:

Instrument ID:

MT\_026 26A5022513.asc

Dilution:

Analysis Date:

1.0 02/26/2013 0111 Leach Batch: Units:

N/A mg/Kg Initial Weight/Volume: Final Weight/Volume: 1.08 g 100 mL

Prep Date:

02/25/2013 1345 N/A

Leach Date:

Analyte	Sample Res	Sample Result/Qual		RPD	Limit	Qual
Aluminum	198		177.4	11	40	
Arsenic	0.62	U	0.61	NC	30	U
Barium	2.0		1.74	16	30	
Beryllium	0.047	В	0.031	NC	30	Ų
*	0.92	U	0.91	NC	30	U
Boron	0.039	В	0.0380	3	30	В
Calaira	33.5	В	29.79	12	30	В
Calcium	0.084	В	0.0731	14	40	В
Chromium	0.13	В	0.093	NC	30	U
Cobalt	0.20	Ū	0.20	NC	30	U
Copper	0.83	Ŭ	0.425	65	40	ВМ
Lead	21.8		19.61	11	30	
Magnesium	14.6		4.81	101	40	M
Manganese	0.24	U	0.24	NC	30	U
Molybdenum		U	0.11	NC	30	U
Nickel	0.11	В	61.82	5	40	В
Potassium	64.9		0.15	NC	30	U
Silver	0.15	U		83	30	ВМ
Vanadium	0.53	В	0.218	44	40	М.
Zinc	1.9		1.20	44	40	,,,,

**Duplicate - Batch: 280-161812** 

Method: 6010B Preparation: 3050B

Initial Weight/Volume:

Final Weight/Volume:

Lab Sample ID: Client Matrix:

280-39178-1 Solid 1.0

Analysis Batch: Prep Batch: Leach Batch:

Units:

280-162255 280-161812 N/A

mg/Kg

instrument ID: Lab File ID:

MT 026 26A3022613.asc

1.08 g

100 mL

Dilution: Analysis Date: Prep Date:

02/26/2013 1943

Leach Date:

02/25/2013 1345 N/A

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Antimony	0.36	U	0.35	NC	40	U
Iron	1350		248.8	138	40	M
Selenium	0.80	U	0.80	NC 2	30 40	U N
Silicon	89.3		86.82	3 NC	30	Ü
Sodium	55.1	U	54.6	NO	-	-

**TestAmerica Denver** 

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Job Number: 280-39178-1

Sdg Number: JP0481

Method Blank - Batch: 280-161750

Client: Washington Closure Hanford

Method: 7471A Preparation: 7471A

Lab Sample ID:

MB 280-161750/1-A Solid

Analysis Batch: Prep Batch:

280-161906

280-161750

Instrument ID: Lab File ID:

MT 033

Client Matrix: Dilution:

1.0

Leach Batch:

Units:

N/A

Initial Weight/Volume:

130223ab.txt

Analysis Date: Prep Date:

02/23/2013 1537

02/23/2013 1230

Leach Date:

mg/Kg

.6 g

Final Weight/Volume:

50 mL

Analyte

N/A

Result

Qual

MDL

RL

Mercury

0.0055

Ū

0.0055

0.017

Lab Control Sample - Batch: 280-161750

Method: 7471A Preparation: 7471A

Instrument ID:

MT\_033

Client Matrix: Dilution:

Lab Sample ID:

Solid

Analysis Batch: Prep Batch: Leach Batch:

280-161906 280-161750 N/A

Lab File ID:

130223ab.txt

Analysis Date: Prep Date:

1.0

02/23/2013 1539 02/23/2013 1230

LCS 280-161750/2-A

Units:

mg/Kg

Initial Weight/Volume: Final Weight/Volume:

.6 g 50 mL

Leach Date:

N/A

Spike Amount 0.417

Result

% Rec.

Limit

Analyte Mercury

0.398

95

87 - 111

% Rec.

97

Qual

Matrix Spike - Batch: 280-161750

Method: 7471A Preparation: 7471A

Lab Sample ID: Client Matrix:

280-39178-2 Solid 1.0

Analysis Batch: Prep Batch: Leach Batch:

Units:

0.0061

280-161906

280-161750 N/A

mg/Kg

Instrument ID: Lab File ID:

Result

0.466

MT 033 130223ab.txt

Initial Weight/Volume: Final Weight/Volume:

.54 q

Analysis Date: Prep Date: Leach Date:

Dilution:

Analyte

Mercury

02/23/2013 1553 02/23/2013 1230

N/A

Sample Result/Qual

U

0.482

Spike Amount

50 mL

87 - 111

Limit

Qual

**TestAmerica Denver** 

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Client: Washington Closure Hanford

Job Number: 280-39178-1

Sdg Number: JP0481

Duplicate - Batch: 280-161750

Method: 7471A Preparation: 7471A

Lab Sample ID:

280-39178-2

Analysis Batch:

Units:

280-161906

Instrument ID:

MT\_033

Client Matrix:

Solid

Prep Batch: Leach Batch: 280-161750

Lab File ID:

130223ab.txt

Dilution:

1.0

N/A

Initial Weight/Volume:

.57 g

Analysis Date: Prep Date:

02/23/2013 1551 02/23/2013 1230 mg/Kg

Final Weight/Volume:

50 mL

Leach Date:

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Mercury	0.0061	U	0.0061	NC	20	U